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P R O P O S A L

DX-134

5-3-55

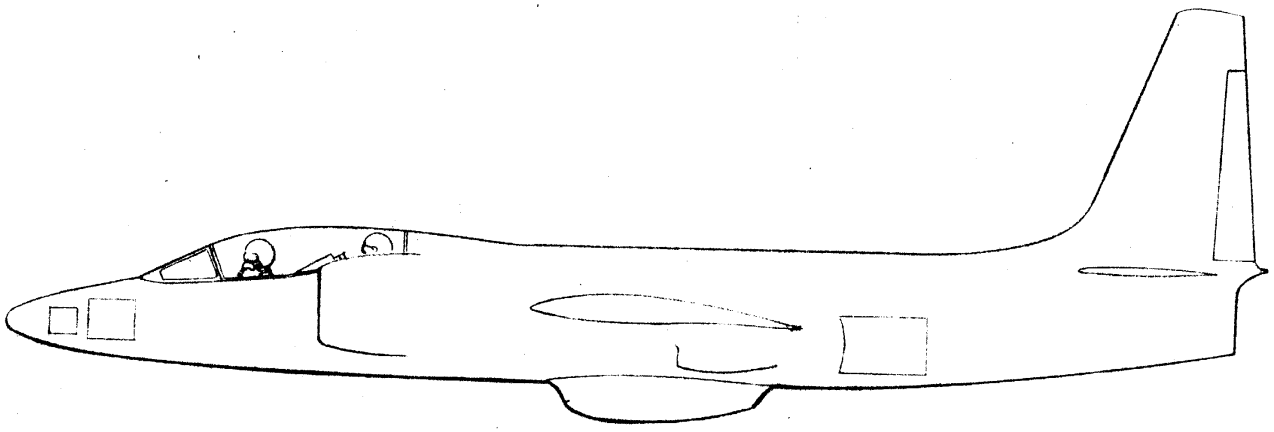
BOMBER VERSION

The airplane can be converted to a bomber airplane with relatively slight changes on structure. A 1,000 lb. bomb installation is proposed in which the bomb is faired externally against the lower portion of the fuselage. Drag is kept to a minimum by a bomb-to-fuselage fairing when the bomb is in place. After the bomb is dropped the fuselage is returned to a clean configuration by jettisoning the fairing.

To accommodate the bombardier and bombing equipment, the present equipment bay just aft of the pilot is modified by extending the canopy and adding the necessary provisions for the bombardier. It is convenient that this section of the fuselage is already designed for pressurization. Also, space is available in the nose of the airplane to house the antenna required for the bombing equipment.

On the following pages are shown:

1. Airplane side view.
2. Performance comparison.
3. Combat radius profile.
4. Weight estimate.
5. Drag estimate.
6. Combat radius estimate.



PROPOSAL
SIDE VIEW
1 IN. = 60 IN.

PERFORMANCE COMPARISON

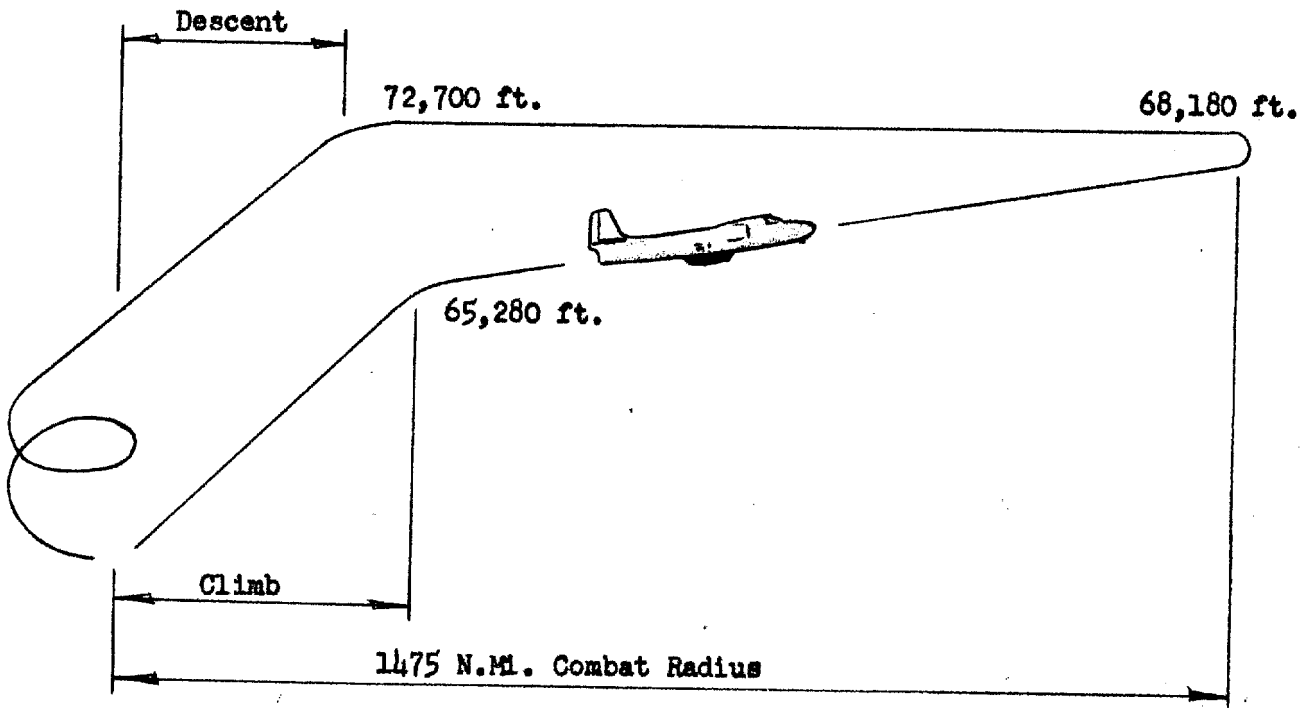
J57-P-31 Engine

	Normal Configuration	1000 lb. Bomb Configuration	Difference
Takeoff Weight	17,000 lb.	18,400 lb.	+1400 lb.
Fuel Load	6,350 lb.	6,350 lb.	0
Radius	1610 N.Mi.	1475 N.Mi.	-135 N.Mi.
50 FPM R/C Ceiling at Target	70,300 ft.	68,180 ft.	-2120 ft.

COMBAT RADIUS PROFILE

18,400 lb. Takeoff Weight

J57-P-31 Engine



		Distance N.Mi.	Fuel Used lb.	Time Hr:Min.
1.	Start, warm-up, takeoff	0	160	0:02
2.	Climb with military power	199	1320	0:30
3.	Cruise out with military power at 445 knots	1276	2320	2:52
4.	Maneuver at Target and Drop Bomb	0	125	0:10
5.	Cruise back with military power at 445 knots	1385	2085	3:07
6.	Descend to sea level	90	140	0:13
7.	Reserve: 30 gallons	0	200	-
		2950	6350	6:54

WEIGHT ESTIMATE

P.W. J57-P-31 Engine

Weight empty, normal configuration		9,650 lb.
Less installation items	-15 lb.	
Bombardier seat & provisions	50 lb.	
Bombardier station, including extended canopy	100 lb.	
Revised weight empty		9,785 lb.
Military load, normal configuration	1,000 lb.	
Less normal equipment	-480 lb.	
Bombardier	200 lb.	
Pressure suit	120 lb.	
Bombing equipment	375 lb.	
Bomb release	10 lb.	
Zero fuel weight, less disposable load		11,010 lb.
1,000 lb. bomb	1,000 lb.	
Droppable bomb fairing	40 lb.	
Fuel, 977 gal.	6,350 lb.	
Takeoff gross weight		18,400 lb.
Landing gross weight with 30 gal. of reserve fuel		11,205 lb.

DRAG ESTIMATE

Low Speed

Wetted area of the airplane is increased 12 square feet by the 1,000 lb. bomb and fairing and 10 square feet by the extended canopy.

$$\Delta C_{D_p} = \frac{(C_f)(\text{Wetted area})}{\text{Wing Area}}$$

$$= \frac{(.0050)(22)}{600} = .0002$$

At Mach .775

Frontal area added to the airplane by the 1,000 lb. bomb plus fairing is 2 square feet. The bomb has a fineness ratio of 6.0.

$$\Delta C_{D_c} = \frac{(C_{D_\pi})(A_\pi)}{600}$$

$$= \frac{(.1)(2)}{600} = .0003$$

Total ΔC_D at Mach .775 = .0005, based on wing area.

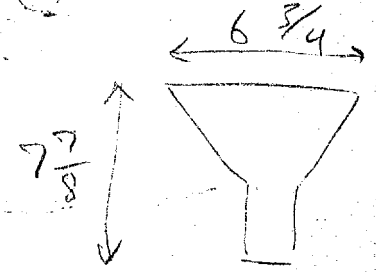
COMBAT RADIUS ESTIMATE

As an average, the airplane in the normal configuration will have a total drag coefficient of .0250 based on wing area during cruise. The drag increase due to the external store is .0005. For the outboard leg of the radius, then, the specific cruise data in Lockheed Report No. 10569 is reduced 2%. For the return flight from the target the specific range in Lockheed Report No. 10569 is used.

Since the initial climb to altitude is made at a lower average drag coefficient, fuel consumed is increased 3% over the normal configuration estimate.

Fuel for 10 minutes at military power is included in the radius calculations to allow for maneuvering at the target. No distance is credited for this operation.

Altitude during cruise out and at the target as compared to the normal configuration is reduced 420 feet to account for the effect of the drag increase on the 50 FPM rate of climb cruise ceiling.



Parallel to Earth lies to ± 2°

" " Earth with ± 2° at normal alt.

One inch bet radome window & lens.

3 inches bet ends and any metal parts

8½ lb/ft

Gross weight	80 000 to 100 000 lbs
Span	under 110 ft
Crew	2 or 3
Combat radius	4 000
	200 n m in and 200 out M 1.3
	at 80, 000
Basic cruise	M .9 at 75 000 (520 K)
Engines (GE)	10/12 in number
6000 lb thrust	scaled up X104 — 1 lb thrust
Transonic compressor	for .1 lb weight (Specific wt. .1)
No afterburning	Could do with .12/.13
All engines buried in wing	
Military load	8 000 / 10 000 lb.
Thrust wt ratio	.65

Hydrogen gives 2.54 times BTU of JP4.